

Title (en)

Tantalum nitride CVD deposition by tantalum oxide densification

Title (de)

CVD-Abscheidung von Tantalnitrid mittels Tantaloxidverdichtung

Title (fr)

Déposition par CVD de nitrure de tantale par densification d'oxyde de tantale

Publication

EP 1127956 A2 20010829 (EN)

Application

EP 01103586 A 20010221

Priority

US 51058200 A 20000222

Abstract (en)

The invention provides a method for forming a metal nitride film by depositing a metal oxide film on the substrate and exposing the metal oxide film to a nitrating gas to densify the metal oxide and form a metal nitride film. The metal oxide film is deposited by the decomposition of a chemical vapor deposition precursor. The nitrating step comprises exposing the metal oxide film to a thermally or plasma enhanced nitrating gas preferably comprising nitrogen, oxygen, and ammonia. The invention also provides a process for forming a liner/barrier scheme for a metallization stack by forming a metal nitride layer over the substrate by the densification of a metal oxide layer by a nitrating gas depositing a metal liner layer. Optionally, a metal liner layer may be deposited over substrate prior to the metal nitride layer to form a metal/metal nitride liner/barrier scheme. The invention further provides a process to form a microelectronic device (610) comprising forming a first electrode (619), forming a metal nitride layer (624) over the first electrode (619) by densifying a metal oxide layer by a nitrating gas to form a metal nitride layer, depositing a dielectric layer (622) over the metal nitride layer (624), and forming a second electrode (621) over the dielectric layer (622). Alternatively, the metal nitride film may comprise the first and second electrodes. <IMAGE>

IPC 1-7

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IPC 8 full level

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Cited by

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